

What is claimed is:

1. A tire having controllable handling characteristics which are variable in real-time, comprising:

5 a mechanism for varying the amount of flexing that the tire is permitted to undergo, which mechanism includes a fluid selected from the group of: (a) an electrorheological fluid; (b) a magnetorheological fluid; and (c) a ferrofluid; and

a mechanism for applying to or removing from the fluid at least one of: (a) an electric current; and (b) a magnetic field.

10 2. The tire of claim 1, wherein the tire is used on a vehicle driven by a driver on a driving surface and wherein the mechanism for applying or removing applies to or removes from the fluid least one of: (a) an electric current; and (b) a magnetic field based at least in part upon at least one of: (a) a change in input from the driver; (b) a condition of the driving surface; and (c) a
15 state of the vehicle.

3. The tire of claim 2, wherein:

(a) the change in input from the driver includes at least one of braking and turning;

(b) the condition of the driving surface includes at least one of wet and dry; and

20 (c) the state of the vehicle includes at least one of skidding, braking, turning, accelerating, and steady-state.

4. The tire of claim 3, wherein the mechanism for varying the amount of flexing further includes at least one chamber for containing the fluid.

25 5. The tire of claim 4, wherein the tire includes two sidewalls and a running surface and the chamber is associated with at least one of: (a) one of the sidewalls; and (b) the running surface.

30 6. The tire of claim 5, wherein the chamber is on an exterior surface of at least one of: (a) one of the sidewalls; and (b) the running surface.

7. The tire of claim 5, wherein the chamber is inside at least one of: (a) one of the sidewalls; and (b) the running surface.

35 8. The tire of claim 5, wherein the chamber is on an interior surface of at least one of: (a)

one of the sidewalls; and (b) the running surface.

9. The tire of claim 1, wherein the amount of flexing that the tire is permitted to undergo at least partially determines the handling characteristics of the tire.

10. The tire of claim 9, wherein the handling characteristics of the tire include: (a) traction; (b) noise; (c) comfort; and (d) rolling resistance.

11. A system for controlling, in real-time, handling characteristics of a tire which is used on a vehicle driven by a driver on a driving surface, comprising:

a mechanism for detecting at least one of: (a) a change in input from the driver; (b) a condition of the driving surface; and (c) a state of the vehicle and for generating a control signal in response thereto;

a mechanism for varying the amount of flexing that the tire is permitted to undergo, which mechanism includes a fluid selected from the group of: (a) an electrorheological fluid; (b) a magnetorheological fluid; and (c) a ferrofluid; and

a mechanism responsive to the control signal for applying to or removing from the fluid at least one of: (a) an electric current; and (b) a magnetic field.

12. The system of claim 11, wherein:

(a) the change in input from the driver includes at least one of braking and turning;

(b) the condition of the driving surface includes at least one of wet and dry; and

(c) the state of the vehicle includes at least one of skidding, braking, turning, accelerating, and steady-state.

13. The system of claim 12, wherein the mechanism for varying the amount of flexing further includes at least one chamber for containing the fluid.

14. The system of claim 13, wherein the tire includes two sidewalls and a running surface and the chamber is associated with at least one of: (a) one of the sidewalls; and (b) the running surface.

15. The system of claim 14, wherein the chamber is on an exterior surface of at least one of: (a) one of the sidewalls; and (b) the running surface.

16. The system of claim 14, wherein the chamber is inside at least one of: (a) one of the

sidewalls; and (b) the running surface.

17. The system of claim 14, wherein the chamber is on an interior surface of at least one of: (a) one of the sidewalls; and (b) the running surface.

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18. The system of claim 11, wherein the amount of flexing that the tire is permitted to undergo at least partially determines the handling characteristics of the tire.

19. The system of claim 18, wherein the handling characteristics of the tire include: (a) traction; (b) noise; (c) comfort; and (d) rolling resistance.

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20. A method for controlling, in real-time, handling characteristics of a tire which is used on a vehicle driven by a driver on a driving surface, comprising:

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detecting at least one of: (a) a change in input from the driver; (b) a condition of the driving surface; and (c) a state of the vehicle; and

applying to or removing from a fluid selected from the group of: (a) an electrorheological fluid; (b) a magnetorheological fluid; and (c) a ferrofluid; at least one of: (a) an electric current; and (b) a magnetic field responsive to the detection of at least one of: (a) a change in input from the driver; (b) a condition of the driving surface; and (c) a state of the vehicle.

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21. The method of claim 20, wherein application of or removal from the fluid of at least one of: (a) an electric current; and (b) a magnetic field varies the amount of flexing that the tire is permitted to undergo.

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22. The method of claim 21, wherein:
(a) the change in input from the driver includes at least one of braking and turning;
(b) the condition of the driving surface includes at least one of wet and dry; and
(c) the state of the vehicle includes at least one of skidding, braking, turning, accelerating, and steady-state.

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23. The method of claim 21, wherein the amount of flexing that the tire is permitted to undergo at least partially determines the handling characteristics of the tire.

24. The method of claim 23, wherein the handling characteristics of the tire include: (a) traction; (b) noise; (c) comfort; and (d) rolling resistance.

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25. The method of claim 20, wherein the steps are carried out in the order recited.

26. A method for controlling, in real-time, handling characteristics of a tire which is used on a vehicle driven by a driver on a driving surface, comprising:

5 detecting at least one of: (a) a change in input from the driver; (b) a condition of the driving surface; and (c) a state of the vehicle; and

varying the amount of flexing that the tire is permitted to undergo in response to the detection of at least one of: (a) a change in input from the driver; (b) a condition of the driving surface; and (c) a state of the vehicle.

10 27. The method of claim 26, wherein:

(a) the change in input from the driver includes at least one of braking and turning;

(b) the condition of the driving surface includes at least one of wet and dry; and

15 (c) the state of the vehicle includes at least one of skidding, braking, turning, accelerating, and steady-state.

28. The method of claim 26, wherein the amount of flexing that the tire is permitted to undergo at least partially determines the handling characteristics of the tire.

20 29. The method of claim 28, wherein the handling characteristics of the tire include: (a) traction; (b) noise; (c) comfort; and (d) rolling resistance.

30. The method of claim 26, wherein the steps are carried out in the order recited.